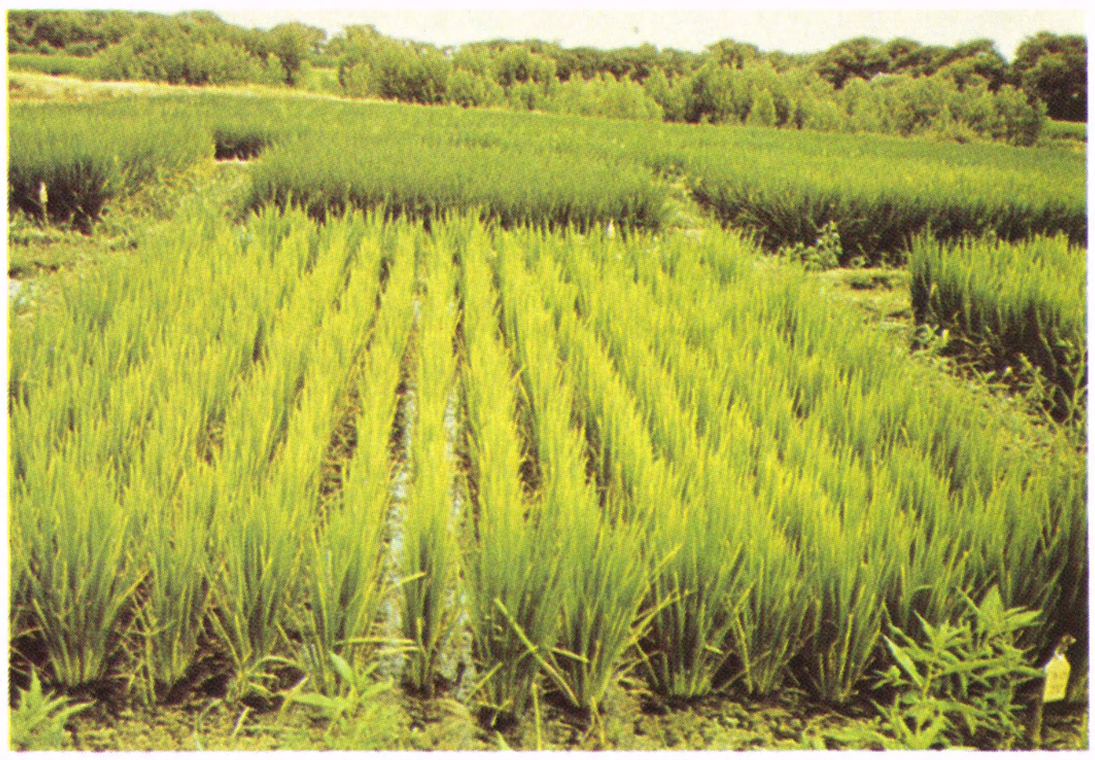
ILLUSTRATED CONCEPTS IN TROPICAL AGRICULTURE

A series prepared by the Department of Agronomy and Soil Science
College of Tropical Agriculture and Human Resources
University of Hawaii

IMPROVED STIFF-STRAWED RICE VARIETIES UTILIZE NITROGEN MORE EFFECTIVELY THAN TRADITIONAL VARIETIES



Indica varieties of rice are generally tall, vigorous-growing, leafy, profuse-tillering, late-maturing, photoperiod-sensitive, and lodging-susceptible. Such varieties offer little hope for substantial yield increases through the application of nitrogen fertilizer because of lodging-susceptibility. These varieties often lodge before maturity and sometimes before flowering. Additions of nitrogen to indica varieties increase vegetative growth and vulnerability to lodging.

An achievement of great practical value has been the development of short, stiff-strawed, lodging-resistant, nitrogen-responsive varieties that are suited to the tropical environment. It should be noted that these varieties are nitrogen-responsive because they are stiff-strawed and lodging-resistant. Unless adequate nitrogen is provided, yields of these improved varieties probably will not exceed yields of traditional tall varieties.

The photographs illustrate the growth characteristics of tall and dwarf types of rice and the consequences of excess nitrogen fertilization of the tall indica types.

Upper left: **A comparison of the stature of tall and dwarf types of rice. The tall rice is more susceptible to lodging if growth and grain production are increased by nitrogen fertilization.**

Upper right: **An example of nitrogen-deficient rice that is in no danger of lodging but has little prospect of yield. Note the improved nitrogen nutrition of the border rows.**

Lower left: **Early lodging of a tropical rice variety induced by nitrogen fertilization.**

Lower right: **Severe loss of yield resulting from lodging on fertile soil in Madras State, India.**

Robert L. Fox and Peter P. Rotar—No. 13, 1978